

TWO NEW GENERA OF DIAPRIINAE
(DIAPRIIDAE, HYMENOPTERA)
WITH TRANSANTARCTIC RELATIONSHIPS

BY LUBOMIR MASNER*

Institute of Entomology, Czechoslovak Academy of Sciences, Praha¹

Up to the present only a few species of proctotrupoid wasps have been known to have transantarctic relationships. The peculiar family Monomachidae is represented both in Australia and South America (Schulz, 1911; Riek, 1955). Among the Proctotrupidae the genus *Austroserphus* Dodd is known from Australia (subg. *Austroserphus* s.str.) and Chile (subg. *Austrocodrus* Ogloblin) (Ogloblin, 1959). In the Scelionidae, *Archaeoteleia* Masner was described with one species from New Zealand and four species from Chile (Masner, 1968). The subfamily Ambositrinae (Diapriidae) was shown to be of southern origin (Fabritius, 1968; Masner, 1969).

The two new genera of Diapriinae (Diapriidae) described below are the first known representatives of this subfamily that show transantarctic relationships. It is believed that with better knowledge of Australian and Neotropical Proctotrupeidea more examples of transantarctic relationships will be discovered. The aim of this paper is to challenge other students in this group to give some attention to this phenomenon in zoogeography.

The two genera described below are also interesting from the point of view of morphology and adaptation. In particular, the Neotropical genus from Brazil displays the highest range of morphological reduction so far discovered in the subfamily Diapriinae. The wingless females are in fact blind as their eyes are reduced to mere points and the ocelli are completely absent. In one species the antenna has only 9 segments and the tarsi are reduced to four segments. This is the first known instance of a diapriid having 4-segmented tarsi. Although these characters appear very remarkable we interpret them as adaptive modifications within a very plastic genus. Biological data are still not available and are greatly desired to understand the nature of these unique adaptations.

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¹Present address: Pestology Centre, Department of Biosciences, Simon Fraser University, Burnaby 2, British Columbia, Canada.

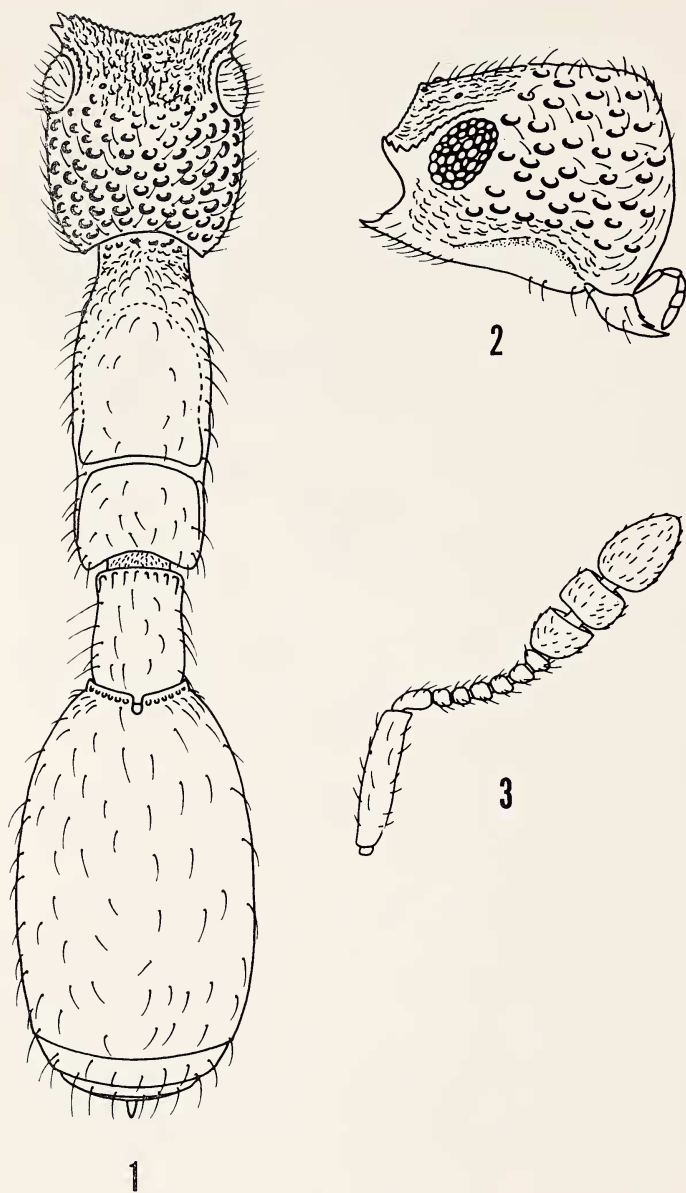


Fig. 1. *Austropria serraticeps* n.sp. (holotype).

Fig. 2. *Austropria serraticeps* n.sp. (holotype), head (lateral view).

Fig. 3. *Austropria serraticeps* n.sp. (holotype), antenna.

Austropria gen.n.

Female. — Most of head heavily punctured; punctures dense, deep and rather large; seen from above head distinctly longer than wide; frons deeply excavated at antennal shelf, bordered with a continuous serrate crest anteriorly, the latter with largest teeth right above eyes; frons above clypeus longitudinally bulging, flanked by two smooth oblong impressions just above mandibles; eyes round, rather small, hairy, composed of large facets; ocelli small yet distinct, lateral ones closer to orbit than to median ocellus; mandibles protruded to form a beak directed almost backwards (opisthognathous); maxillary palpi 5-segmented, labial 2-segmented; antenna 11-segmented, with an abrupt 3-segmented club.

Mesosoma extensively modified due to apterism; most of the sutures obliterated or indistinct; prothorax rather large, suture dividing prothorax from mesoscutum very faint and almost invisible; mesoscutum almost flat, fused with scutellum and metanotum; suture dividing scutellum from metanotum indicated by an indistinct row of minute punctures; tegulae in the form of minute points, wings wholly absent; propodeum very long, separated distinctly from thorax by deep cleft, unarmed, flat, in same level as the rest of mesosoma; a faint suture running down from tegula to front coxa; tarsi 5-segmented; spur of front tibia unusually long.

Petiole cylindrical, slightly longer than wide; front margin of great tergite slightly elevated to form a foveolated collar, notched medially; great tergite occupying most of the length of metasoma; terminal segments very narrow, yet rather loose and not fused in a solid plate; great sternite with no fold basally.

Type species: *Austropria serraticeps* sp.n.

Austropria serraticeps sp.n.

(figs. 1, 2, 3)

Female holotype. — Sandringham, Vic., May 1928, J. C. Goudie coll. (National Museum of Victoria, Melbourne); unique.

Length 1.5 mm. Ferruginous; antennal club, eyes and tip of metasoma black.

Head covered all over with dense silvery hairs, longer than wide (20:10), much wider than mesosoma (16:12), seen laterally longer than high (20:16); punctures on occiput, temples and genae large and deep yet less dense, not contiguous; punctures on vertex obscured by fine shagreened sculpture (between eyes); frons between antennal insertion and serrate crest almost smooth and shining, deeply concave; teeth of the serrate crest extending along the inner orbit,

largest teeth just above eyes; eyes rather small, much shorter than temples (5:10); antennal socket with two little teeth directed forwards; scape finely shagreened, as long as 7 following segments combined, longer than wide (12:3), pedicel moderately oblong (4:2), segments 3-8 more narrow than pedicel, progressively shortened, as long as wide till slightly transverse, almost penicillate; club (9-11th) abrupt, massive, progressively thickened, apical segment longest and widest, segments of club in proportions 3:4; 4:5; 7:5.5.

Mesosoma hairy like head, distinctly elongated (28:12) and constricted; prothorax dorsally with scattered punctures and tufts of hairs, distinctly neck-like protruded anteriorly; mesonotum only very slightly convex, smooth, highly polished, with only few isolated setigerous punctures; propodeum flat and almost smooth dorsally, with few scattered shallow punctures; posterior margin only slightly excavated, with no teeth or spines.

Petiole slightly elongated (10:7.5), with several indistinct longitudinal costae; rest of metasoma elongated (35:20), rather obtuse apically, with scattered hairs all over.

Coecopria gen.n.

Female. — Head heavily and evenly punctured all over, punctures deep, dense and contiguous; seen from above head either almost globose or elongated; antennal socket distinctly protruded forwards; frons more or less excavated at antennal shelf, bordered laterally (above eyes) with a ridge that tends to disappear medially; ocelli absent; eyes strongly reduced to one ommatidium point obviously devoid of function; mandibles opisthognathous, protruded backwards to form a beak; maxillary palpi reduced to an oval 1-segmented process, labial palpi appearing completely absent; antenna 9 or 10-segmented, with an abrupt 3-segmented club.

Mesosoma showing different degrees of apterism in fusion of sclerites and sutures; mesoscutum always fused with scutellum and metanotum; prothorax either separated from mesothorax by a suture or fused with it; propodeum separated from thorax in two species but fused with it in one species; mesosoma almost flat above, all sclerites at same level; wings and tegulae absent but preserved as minute scales in one species; dorsal part of mesosoma either smooth and shining or punctured densely like head; tarsi 5 or 4-segmented; spur of front tibia very long.

Petiole cylindrical, elongated; front margin of great tergite slightly elevated in collar, notched medially; great sternite with longitudinal horseshoe-shaped fold with pilosity in the anterior part.

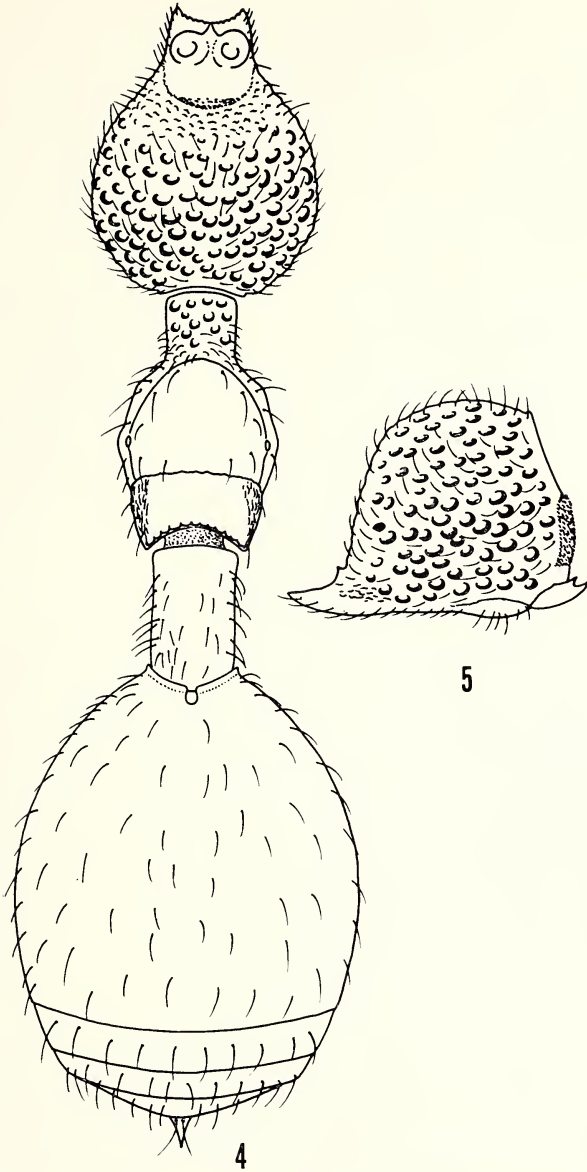


Fig. 4. *Coccopria plaumanni* n.sp. (holotype).

Fig. 5. *Coccopria plaumanni* n.sp. (holotype), head (lateral view).

Type species: *Coecopria plaumanni*² sp.n.

***Coecopria plaumanni* sp.n.**

(figs. 4, 5, 6, 7)

Female holotype.—Nova Teutonia, Santa Catarina, Brazil, October 1963, Fritz Plaumann coll. (Museum of Comparative Zoology, Cambridge, Mass., type no. 31727).

Length 1.5 mm. Light chestnut brown, metasoma darker, antennae (including club) and legs bright yellow.

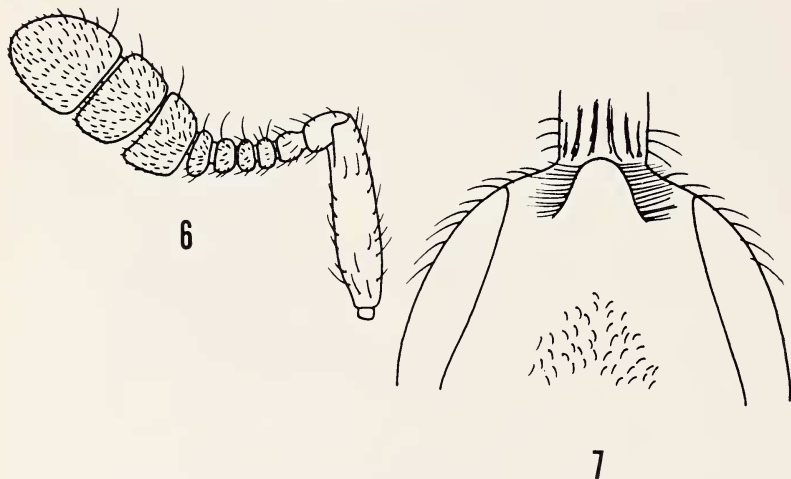


Fig. 6. *Coecopria plaumanni* n.sp. (holotype), antenna.

Fig. 7. *Coecopria plaumanni* n.sp. (holotype), large sternite.

Head covered with dense hairs all over, almost globose if viewed dorsally but slightly longer than wide (27:22), if antennal prominence is included, longer than high (27:21), much wider than mesosoma (22:17); hind genae with little tufts of dense whitish hairs; punctures deep and dense yet not fully contiguous, particularly on occiput; vertex with fine transverse rugulosity; antennae as in fig. 6; scape and pedicel finely shagreened.

Mesosoma elongated (30:17), almost as wide as high (17:16), with long silvery hairs all over, hairs longer than those on head but less dense; prothorax clearly separated dorsally from mesothorax by suture, laterally from mesopleura by suture running down from spiracle to front coxa, neck-like constricted anteriorly and here densely hairy; mesoscutum fused with scutellum and metanotum, almost flat, wider than long (14:11), smooth and shining, with few

²Named in honour of Mr. F. Plaumann in recognition of his interesting entomological collections in the Brazilian tropics.

scattered punctures; front wings reduced to minute scales; propodeum separated from thorax by a distinct suture, shining, reticulate-punctate all over; femora slightly incrassated; tarsi 5-segmented.

Petiole elongated (15:8), almost smooth and shining dorsally, with few scattered punctures, finely longitudinally striated laterally; median notch on front margin of great tergite deep and very distinct; great tergite extending to $\frac{3}{4}$ of the length of the body of metasoma (32:12), i.e. the terminal segments not particularly narrow; great sternite with horseshoe-shaped fold (with pilosity) very short, indicated only very anteriorly.

Material examined. — 9 females (paratypes in MCZ, Cambridge, and coll. L. Masner, Prague). 8 ♀♀, Nova Teutonia, Santa Catarina, Brazil, July 1959, August 1963, November 1962, all Fritz Plaumann collector. 1 ♀, Ibicare (27°09'; 51°18') Brazil, 600 a.s.l., September 1960, Fritz Plaumann collector.

Variability. — No substantial variability encountered except for slight variation in body length (1.4-1.8 mm.).

Male. — Unknown.

Host. — Unknown.

Coecopria bella sp.n.

(Figs. 8, 9)

Female holotype. — Nova Teutonia, Santa Catarina, Brazil, July 1959, Fritz Plaumann coll. (Museum of Comparative Zoology, Cambridge, Mass., type no. 31725).

Length 2.1 mm. Head and mesosoma reddish-brown, legs and antennae honey yellow, metasoma dark brown to black, petiole brownish.

Head longer than wide (33:23), wider than mesosoma (23:17), longer than high (33:22); punctures very large and deep, contiguous; a small smooth spot above antennal insertion; hind genae with little tufts of whitish dense hairs, the same pilosity on opposite side of prosternum; crest of vertex distinct just above the single ommatidium, missing medially; scape finely shagreened, as long as 6 following segments combined, pedicel and 3rd segment slightly elongated, segments 4-7 shortened till transverse, club progressively incrassate, its first segment (i.e. 8th antennal segment) the smallest.

Mesosoma highly shining, hairy like head, constricted, slightly convex dorsally, longer than wide (37:17); all sutures fused, making mesosoma one solid body (fine suture running from prothoracic spiracle down to front coxa, propodeum laterally with row of punctures indicating the former suture); punctures rather deep and dense on

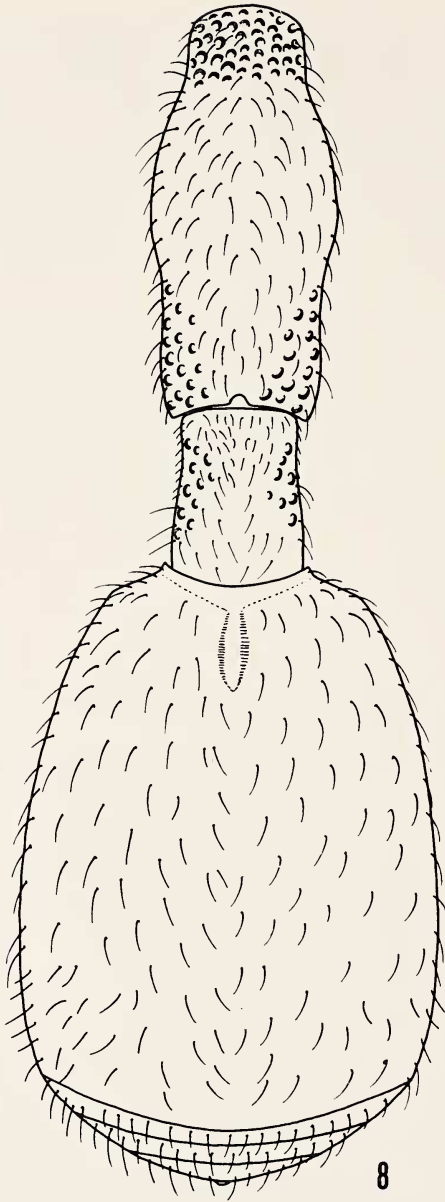


Fig. 8. *Coccopria bella* n.sp. (holotype).

neck-like constriction of prothorax but scattered and fine on rest of mesosoma; hind margin of propodeum with a delicate notch medially.

Petiole smooth and shining, with scattered fine punctures and small hairs, elongated (15:11); front margin of great tergite with very indistinct notch medially followed by impressed groove, tergite smooth, shining, hairy, occupying almost the whole body of mesosoma; the fold on great sternite very distinct, extending back to very end of sternite and here united to form a complete oval suture.

Material examined. — 3 females (paratypes, in coll. MCZ, Cambridge, Mass. and coll. L. Masner, Prague). Same data as in holotype.

Variability. — No variability encountered.

Male. — Unknown.

Host. — Unknown.

Coecopria pygmea sp.n.

(figs. 10, 11, 12, 13)

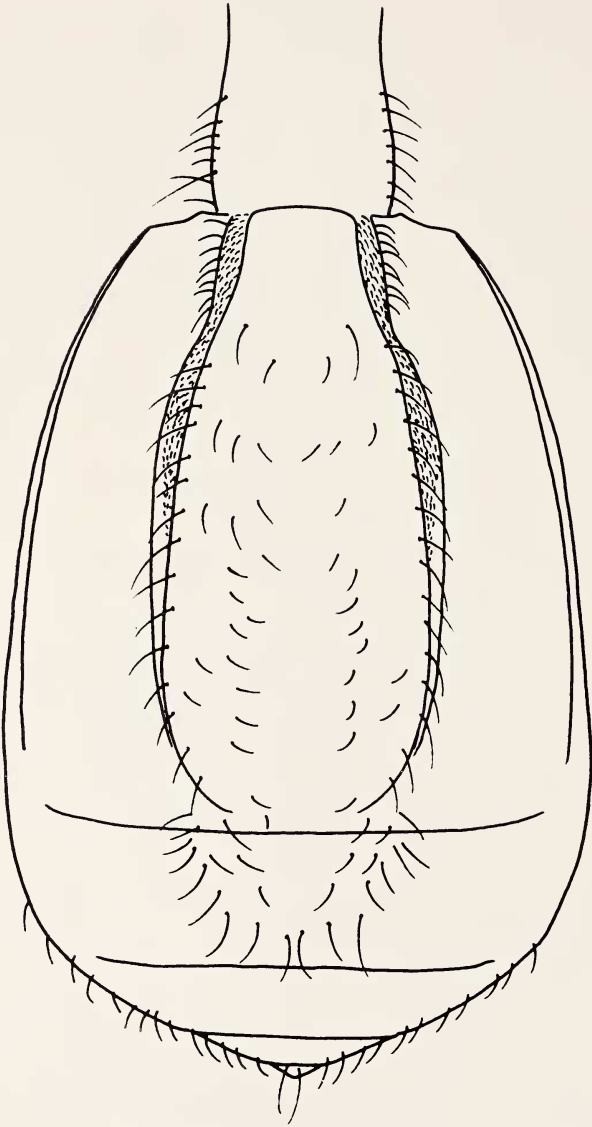
Female holotype. — Nova Teutonia, Santa Catarina, Brazil, September 1960, Fritz Plaumann coll. (Museum of Comparative Zoology, Cambridge, Mass., type no. 31726).

Length 1.1 mm. Head, scape, mesosoma and petiole amber yellow, rest of metasoma darker, flagellum and legs bright yellow.

Head covered with dense silvery hairs all over, longer than wide (17:14), wider than mesosoma (14:11), longer than high (17:12); punctures fine yet very dense, contiguous, absent only on little smooth spot just above antennal insertion; hind genae with no tuft of hairs; vertex with crest which is sharp and distinct laterally but almost missing medially; antenna as in fig. 11.

Mesosoma constricted, almost flat dorsally, longer than wide (20:11), slightly wider than high (11:9), hairy; prothorax fused with mesothorax both dorsally and laterally; mesoscutum fused with scutellum and metanotum, evenly longitudinally rugoso-punctate all over; mesepisternum distinctly separated by sutures from both prothorax and propodeum; propodeum separated from thorax by constriction and distinct suture both dorsally and laterally, of same sculpture as mesonotum; coxae and femora incrassate; tarsi 4-segmented (!), claws large (fig. 12).

Petiole slightly longer than wide (8:5), bent if seen laterally, hairy and finely punctate all over; front margin of great tergite deeply notched medially, the tergite almost bare antero-medially but densely hairy laterally and posteriorly, occupying not more than 2/3 of the



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Fig. 9. *Coccopria bella* n.sp. (holotype), large sternite.

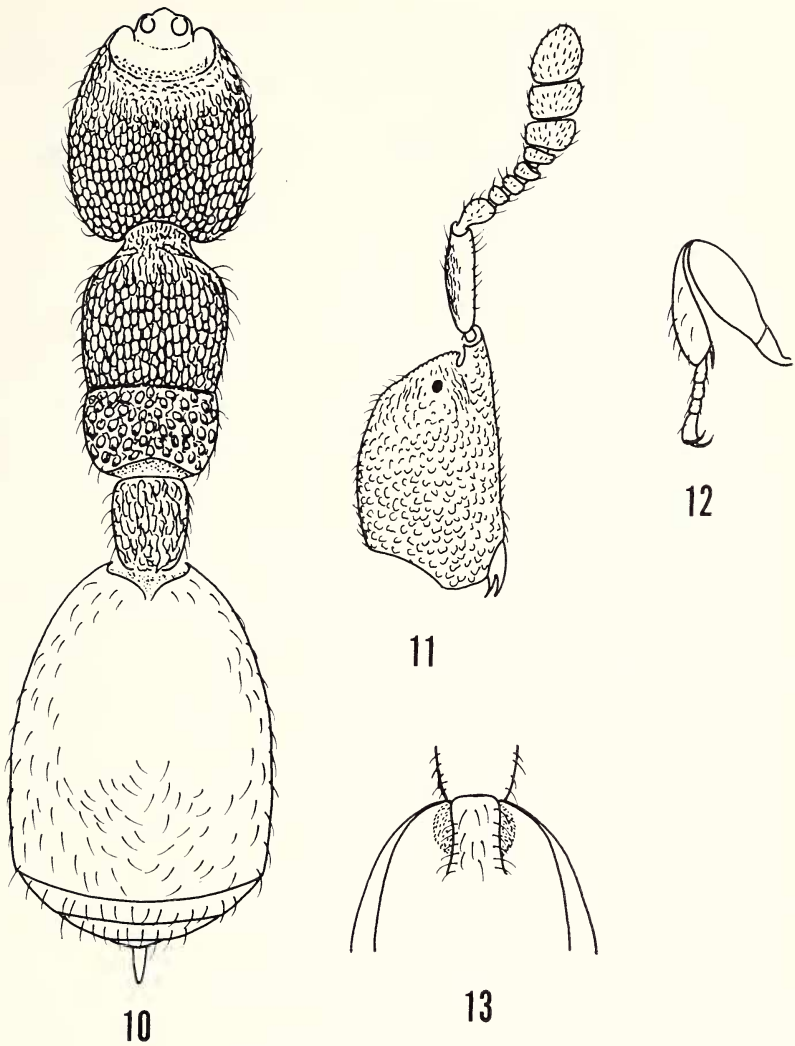


Fig. 10. *Coecopria pygmaea* n.sp. (holotype).

Fig. 11. *Coecopria pygmaea* n.sp. (holotype), head and antenna.

Fig. 12. *Coecopria pygmaea* n.sp. (holotype), middle leg.

Fig. 13. *Coecopria pygmaea* n.sp. (holotype), large sternite.

length of the metasomatic body; great sternite distinctly protruded forwards to form a slight hump, horseshoe-shaped fold protruded backwards to $1/3$ of length of the sternite, pilosity in the fold quite distinct and dense.

Material examined.— 3 females (paratypes, in coll. MCZ, Cambridge, Mass., and coll. L. Masner, Prague). 2 ♀♀, Chapeco, $27^{\circ}07'$; $52^{\circ}36'$ Brazil, 600 m.a.s.l., August 1960, Fritz Plaumann collector. 1 ♀, Erechim, $27^{\circ}35'$; $52^{\circ}15'$ Brazil, 750 m.a.s.l., July 1960, Fritz Plaumann, collector.

Variability.— Female from Erechim much paler in colour (pale yellow) with finer sculpture of mesosoma and with great tergite extending but to $1/2$ of the length of metasomatic body.

Male.— Unknown.

Host.— Unknown.

Key to species of *Coecopria* gen.n.

- 1) Propodeum distinctly separated anteriorly from thorax by suture or row of deep punctures (figs. 4, 10); horseshoe-shaped fold of great sternite not extending beyond the basal $1/3$ of the sclerite (figs. 7, 13) 2
- Prodeum completely fused with thorax (fig. 8); horseshoe-shaped fold of great sternite extending down to very apex of sclerite and here united, forming an oval field (fig. 9) *Coecopria bella* sp.n.
- 2) Antenna 10-segmented; tarsi 5-segmented; mesonotum almost smooth, shining, with only few scattered fine punctures; head globose (fig. 4) *Coecopria plaumanni* sp.n.
- Antenna 9-segmented; tarsi 4-segmented; mesonotum evenly longitudinally rugoso-punctate all over; head elongated (fig. 10) *Coecopria pygmea* sp.n.

DISCUSSION

Twelve genera of Diapriinae are known to have fewer than 12 antennal segments: *Solenopsia* Wasmann (Palearctic), *Bruesopria* Wing (Nearctic), *Philolestes* Kieffer (Neotropic), *Doliopria* Kieffer (Neotropic, Nearctic), *Mitropria* Ogloblin (Neotropic), *Ferrieropria* Sundholm (Ethiopian), *Solenopsiella* Dodd (Australia), *Polydiapria* Dodd (Australia), *Nanopria* Kieffer (Ethiopian), *Xanthopria* Brues (Neotropic), *Notoxopria* Kieffer (Neotropic) and *Asolenopsia* Kieffer (Neotropic).

Austropria and *Coecopria* show close ties only to *Doliopria* Kieffer and (?) *Mitropria* Ogloblin. The punctate head in *Austropria* and

Coecopria may be compared with similar structures in *Malvina* Cameron (New Zealand) and *Odontopria* Kieffer (Oriental), but this is merely due to convergence. *Austropria* is superficially reminiscent of *Psilus* Panzer (*Galesus* Haliday) but has a different structure of the terminal segments of the metasoma. *Austropria* shows no ties to any of Australian genera (? *Solenopsiella* Dodd) but does to Neotropical *Doliopria* and particularly to *Coecopria*. The latter genus is apparently closest to *Austropria*, but is also close to *Doliopria* and (?) *Mitropria* (see the key below). Among the characters considered to be common and typical for both *Austropria* and *Coecopria* the following should be emphasized: head heavily punctured, front margin of great tergite notched medially, antennae with 11 or less segments, abrupt 3-segmented antennal club, mandibles protruded to form an opisthognathous beak, high degree of apterism and reduction of mesosoma.

Key to genera related to *Austropria* and *Coecopria*

- 1) Head heavily thimble-like punctured, punctures rather large, deep and dense (cf. *Malvina* Cam. and *Odontopria* Kieff.) 2
- Head with no special punctulation, smooth, shining, sometimes with minute teeth anteriorly 3
- 2) Antenna 11-segmented; eyes well developed, ocelli present; great sternite with no fold basally; palpi 5, 2 *Austropria* gen.n.
- Antenna 10 or 9-segmented; eyes reduced to one ommatidium point; ocelli absent; great sternite basally with a peculiar horse-shoe-shaped fold filled with pilosity, palpi 1, 0 *Coecopria* gen.n.
- 3) Vertex with a few minute teeth; anterior margin of great tergite not notched medially; mandibles hypognathous, protruded downwards to form a beak *Mitropria* Ogloblin
- Vertex unarmed; anterior margin of great tergite notched medially; mandibles normal and not protruded *Doliopria* Kieffer

If compared with each other *Austropria* is, no doubt, more plesiomorphous and less specialized than *Coecopria*. Table I illustrates this development.

Coecopria presents by itself a fine example of evolution within one genus. The most plesiomorphous is *C. plaumanni* (the type species). It has 10-segmented antenna, the propodeum clearly separated from thorax, a well developed suture between the prothorax and mesoscutum, 5-segmented tarsi and the fold on the great sternite

less extended backwards. Moreover, it is the only species in *Coecopria* with rudiments of wings. *C. pygmea* is considered apomorphous for strong morphological reduction of antennae (9-segmented), tarsi (4-segmented) and suture between prothorax and mesoscutum. *C. bella* exhibits both the highest degree of reduction of mesosoma (all sutures fused) and highest specialization in the horseshoe-shaped fold of great sternite.

TABLE I

CHARACTER	<i>Austropria</i>	<i>Coecopria</i>
Antennal segments	11	10 (2 spp.) or 9 (1 sp.)
Maxillary palpi	5	1
Labial palpi	2	0
Eyes	only slightly reduced but functioning	reduced to one ommatidium point devoid of function
Ocelli	reduced yet well defined	absent
Propodeum	separated from thorax by deep cleavage	separated (2 spp.) or fused with thorax (1 sp.)
Suture between prothorax and mesoscutum	very faint yet developed	present (1 sp.) or fused (2 spp.)
Tarsi	5	5 (2 spp.) + (1 sp.)
Punctulation of head	incomplete, uneven and less dense	complete, even, the punctures contiguous
Great sternite	no specialization	horseshoe-shaped fold extending back to 1/3 of sternite (2 spp.) or down to very apex of sternite (1 sp.)

The high degree of morphological reduction on the one hand (*Austropria*, *Coecopria*) and the peculiar specialization of the great sternite on the other hand (*Coecopria*) are interpreted as potential adaptations to special behaviour and habitat. Unfortunately, this can be only guessed at, as no ecological or biological data are available both for *Austropria* and *Coecopria*. Particularly in *Coecopria* these adaptations are really striking and we may speculate about

myrmecophylic habits in this genus. The punctulation of the head in *Coecopria* might be explained as mimicry of the host ants. The dense pilosity within the horseshoe-shaped fold on the great sternite may be explained as a source of an attractive exudate licked by ants. The formation of the mouth parts (reduction of palpi, opisthognathous mandibles) together with the strong reduction of eyes might indicate that the species of *Coecopria* are fed by ants. The absence of males in material of *Coecopria* suggests thelytoky as a possible mode of reproduction.

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SUMMARY

Austropria gen.n. (Diapriidae, Diapriinae) with *serraticeps* sp.n. as type-species is described from Australia (Victoria). *Coecopria* gen.n. (Diapriidae, Diapriinae) is described from Brazil, containing three new species; *plaumanni* sp.n. (type-species), *bella* sp.n. and *pygmea* sp.n.

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